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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/726,997

12/02/2003

Andrew J. Ouderkirk

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08/28/2006

3M INNOVATIVE PROPERTIES COMPANY

PO BOX 33427

ST. PAUL, MN 55133-3427

EXAMINER

MIDKIFF, ANASTASIA

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 08/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/726,997	<b>Applicant(s)</b> OUDERKIRK ET AL.	
	<b>Examiner</b> Anastasia Midkiff	<b>Art Unit</b> 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 February 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>13 June 2006</u> * <u>30 DEC 2005</u>                                     | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Double Patenting*

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-14 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-17 of copending Application No. 10/727,026 (hereinafter '026). Although the conflicting claims are not identical, they are not patentably distinct from each other for the following reasons:

- Claim 1 of the instant application corresponds to claims 1 and 2 of '026. Claims 1 and 2 of the '026 application teach most of the limitations of Claim 1 of the present application, except for the phosphor material being disposed between the LED and the reflector. Claims 1 and 2 of the '026 application teach that the non-planar reflector must be in a position to both transmit visible light and reflect excitation light from the LED onto the phosphor material, wherein the

most efficient placement for the phosphor material to receive the most reflected light would be between the non-planar reflector and the LED.

- Claim 2 of the instant application directly corresponds to claim 4 of '026.
- The remaining claims directly correspond to each other and will not further be individually specified.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1-14 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of copending Application No. 10/727,072 (hereinafter '072). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the instant application are broader than the claims of '072 and therefore are anticipated thereby. For example:

- Claim 1 of the instant application is anticipated by claims 1 and 2 of '072. Claims 1 and 2 of the '072 application teach most of the limitations of Claim 1 of the present application, except for the phosphor material being disposed between the LED and the reflector. Claims 1 and 2 of the '072 application teach that the non-planar reflector must be in a position to both transmit visible light and reflect excitation light from the LED onto the phosphor material, wherein the

most efficient placement for the phosphor material to receive the most reflected light would be between the non-planar reflector and the LED.

- Claim 2 directly corresponds to claim 3 of '072.
- Claim 3 directly corresponds to claim 4 of '072.
- The remaining claims directly correspond to each other and will not further be individually specified.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1,2,3,4,6,7,8,9,10,11,12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vriens et al. (US Patent 5,813,753; hereinafter Vriens) in view of Fleming.**

Re claim 1: Vriens discloses, in figure 3 and throughout the disclosure, a light source comprising:

- an LED (31) that emits excitation light;

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- a first multilayer reflector (37) that reflects at least a portion of visible light and transmits the excitation light (column 5, lines 6-7; column 5, lines 51-53); and
- a layer of phosphor material (phosphor grains) spaced apart from the LED (31) in an epoxy (34) adjacent the multilayer reflector, the phosphor material emitting visible light when illuminated with excitation light.

Vriens further discloses the multilayer reflector comprised of alternating layers of high and low refractive material.

However, Vriens fails to teach or fairly suggest the multilayer reflector being flexible.

Fleming teaches the substitution of a flexible polymeric multilayer reflector for that of a reflector comprised of alternating layers of high and low refractive material (column 2, lines 5-8; column 6, lines 21-39; column 8, lines 1-6).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the reflector of Fleming for that of Vriens because it reduces the cost of the reflector when higher refractive indices are unnecessary.

Re claims 2 and 3: Vriens discloses the excitation light to comprise UV/blue light (column 3, line 19).

Re claim 4: Vriens discloses the phosphor material further comprising an adhesive (35).

Re claim 6: Fleming discloses the first flexible multilayer reflector is a polymeric material substantially free of inorganic materials (column 7, lines 38-45).

Re claim 7: Vriens discloses, in figure 3 and throughout the disclosure, the layer of phosphor material (34; phosphor grains) is a discontinuous layer of phosphor material.

Re claim 8: Vriens discloses, in figure 3 and throughout the disclosure, the discontinuous layer of phosphor (34; phosphor grains) is a plurality of lines of phosphor material or a pattern of phosphor material.

Re claim 9: Vriens discloses, in figure 3 and throughout the disclosure, the layer of phosphor material is a plurality of dots of phosphor material (34).

Re claim 10: Vriens and Fleming show all the limitations as shown above. Vriens further discusses the importance of the size of the phosphor grain that is selected (column 3, lines 35-37).

However, Vriens and Fleming fail to teach or fairly suggest each dot having an area of less than  $10,000\mu\text{m}^2$ .

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute a phosphor dot having an area of less than  $10,000\mu\text{m}^2$

within the device disclosed by Vriens and Fleming because it maximizes the conversion of UV/blue light into visible light using a minimum amount of phosphor.

Re claims 11 and 12: Vriens discloses the plurality of dots comprise phosphor material that emits red, green and blue light when illuminated with excitation light (column 3, lines 52-56).

Re claim 14: Vriens discloses at least a first phosphor dot emitting light at a first wavelength and a second phosphor dot emitting light at a second wavelength different than the first wavelength (column 3, lines 54-55).

**Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vriens and Fleming as applied to claim 1 above, and further in view of Schrenk (US Patent 5,540,978).**

Vriens and Fleming teach all the limitations as shown above, including the reflector comprising polymeric material.

However, they fail to teach or fairly suggest a non-planar flexible multilayer reflector that comprises a polymeric material that resists degradation when exposed to U.V. light.

Schrenk discloses the use of a flexible multilayer reflector comprising polymeric material that resists degradation when exposed to U.V. light within a light device (column 2, lines 62-66).



It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the multilayer reflector of Schrenk in the device taught by Vriens and Fleming because it maximizes the life of the reflector thereby maximizing the life of the device.

**Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vriens and Fleming as applied to claim 1 above, and further in view of Weber et al. ("Giant Birefringent Optics in Multilayer Polymer Mirrors" hereinafter Weber).**

Vriens and Fleming teach all the limitations as shown above, including a first and second thermoplastic polymer.

However, they fail to teach or fairly suggest at least some of the layers are birefringent.

Weber discloses the use of birefringent layers within a multilayer polymer mirror.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include birefringent layers within the device of Vriens and Fleming because the birefringent layers increase the reflectivity of the reflector while the incident angle increases thereby minimizing the amount of excitation light that is reflected back into the device.

### ***Response to Arguments***

Applicant's arguments, see Applicant Response, filed 28 February 2006, with respect to Obviousness Type Double Patenting Rejection over Claims of application

number 10/726,995 have been fully considered and are persuasive. The Double Patenting Rejection of Claims 1-14 over 10/726,995 has been withdrawn.

Applicant's arguments with respect to Obviousness Type Double Patenting over the claims of application numbers 10/727,026 ('026) and 10/727,072 ('072) have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 28 February 2006, regarding the 35 USC 103(a) rejections over Vriens et al., Fleming et al., Schrenk et al., and/or Weber et al., have been fully considered but they are not persuasive.

With respect to the 35 USC 103(a) rejections of Claims 1-4, 6-12, and 14 as unpatentable over Vriens et al. (USP# 5,813,753, "Vriens") in view of Fleming et al. (USP# 6,172,810, "Fleming"), Applicant asserts that neither Vriens or Fleming teach "a layer of phosphor material spaced apart from the LED." Examiner respectfully disagrees.

The layer of phosphor material in Vriens is a discontinuous layer of phosphor dots (phosphor grains) within an epoxy material (34), and, as such, the phosphor layer is spaced apart from the LED (Figure 3). Examiner notes that applicant specification, Page 19, Lines 9-21, the terms continuous and discontinuous are mentioned, but not defined in a manner that excludes the phosphor grains of the Vriens reference. The terms "uniform" and "non-uniform" as relates to the pattern of phosphor material layers are also discussed, but are not positively defined. The plurality of "dots" of phosphor material described in this passage are defined as a "plurality of regions having a small area" (Line 12) and that said dots, "can have any regular or irregular shape, and need

not be round in plan view” (Lines 19-20). As such, the phosphor grains of Vriens satisfy the applicant’s definition of a discontinuous phosphor layer composed of dots. The rejection has been clarified accordingly in the above action.

Further, with respect to Claim 4, Applicant asserts that Vriens does not teach that phosphor layer further comprises an adhesive. Examiner respectfully disagrees.

Vriens teaches an epoxy material, as admitted by Applicant (See Applicant Remarks, Page 7, Lines 20-22), said epoxy known to be an adhesive material, and wherein said epoxy adheres to both the phosphor grains and to the LED (Figure 3, and Abstract). Additionally, Examiner notes that prior art cited in the previous office action teaches several types of adhesive materials used in conjunction with phosphor material: e.g. Schrenk (USP# 5,540,978) teaches an adhesive layer used to join two polymer layers in a thin film device for use with LED (Column 7, Lines 62-64), and that the use of adhesives in thin film optic devices is known in many arts, including that of the present invention.

Furthermore, with respect to Claims 7-9, Applicant asserts that Vriens does not teach a discontinuous layer of phosphor material as defined by the Applicant’s own specification. Examiner respectfully disagrees.

Applicant points to the specification, Page 3, Lines 1-23, as support for the assertion that one or more phosphor materials mixed with a binder is described as a “substantially uniform phosphor layer.” Examiner respectfully submits that this phrase is not found in the passage cited. Applicant also points to the specification at Page 9, Line 14 to Page 10, Line 3 as support for this assertion, wherein the Examiner respectfully

submits that although the phrase “substantially uniform phosphor layer” is found on Line 15 of Page 9, it is not used to describe the phosphor layer composed of one or more phosphor materials mixed with a binder in the manner quoted by Applicant. Examiner notes that applicant specification, Page 19, Lines 9-21, the terms continuous and discontinuous are mentioned, but not defined in a manner that excludes the phosphor grains of the Vriens reference. The terms “uniform” and “non-uniform” as relates to the pattern of phosphor material layers are also discussed, but are not positively defined. The plurality of “dots” of phosphor material described in this passage are defined as a “plurality of regions having a small area” (Line 12) and that said dots, “can have any regular or irregular shape, and need not be round in plan view” (Lines 19-20). As such, the phosphor grains of Vriens satisfy the applicant’s definition of a discontinuous phosphor layer composed of dots.

With respect to the remaining 35 USC 103(a) rejections as unpatentable over Vriens et al., Fleming et al., Schrenk et al., and/or Weber et al., the response is as for Vriens et al. and Fleming et al. as above, with respect to the spacing of phosphor material and LED.

Therefore, the rejections of Claims 1-14 with respect to Obviousness Type Double Patenting over the claims of application numbers 10/727,026 (‘026) and 10/727,072 (‘072), and the 35 USC 103(a) rejections over Vriens et al., Fleming et al., Schrenk et al., and/or Weber et al., are maintained.

**Conclusion**


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anastasia Midkiff whose telephone number is 571-272-5053. The examiner can normally be reached on M-F 7-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on 571-272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ASM  
8/14/06



  
**ALLEN C. HO**  
**PRIMARY EXAMINER**